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10/526,702	09/14/2005	Robert S Bailey	020324 232P2	7436

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EXAMINER	
BAND, MICHAEL A	

ART UNIT	PAPER NUMBER
1795	

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12/03/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/526,702	BAILEY ET AL.	
	Examiner	Art Unit	
	MICHAEL BAND	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *36-50* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *36-50* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

2. Claims 43-45 and 47-50 are rejected under 35 U.S.C. 102(a) as being Ford et al (US Patent No. 6,887,356).

With respect to claims 43-45 and 47-50, Ford et al discloses hollow cathode sputter targets and methods of making the hollow cathode sputter targets (abstract). Fig. 5 depicts steps of taking a sputtering metal workpiece (i.e. blank) and cold-rolling to obtain a shaped sputter workpiece with the stated crystallographic orientations, with Ford et al also declaring that optional annealing steps are avoided (col. 3, lines 51-61). Ford et al further teaches sputter target composed of tantalum, aluminum, titanium, or copper (col. 5, lines 2-7), with a specific example of commercially pure tantalum of (100) used (col. 9, lines 60-67), where alternatively the target has a texture of a mixed (111)-(100) (i.e. first and second crystallographic orientation) global texture, such that the grain texture having the (100) orientation normal direction to the sputter surface are scattered such that there are no localized groupings of the (100) texture (col. 8, lines 36-42). Ford et al also discloses at least the sidewalls (i.e. second region) are a homogenous microstructure of consistent grain structure and texture (i.e.

crystallographic orientations) (col. 4, lines 59-63), thus the end wall or dome (i.e. first region) is not a homogenous mixture. Fig. 3 depicts a sputtering target formed made by the cold-rolling of figs. 4, with a top portion (i.e. first region) [15'] and sidewall (i.e. second region) [31] where said sidewall is deformed greater than 50%.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 36-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhoades et al (US Patent No. 5,085,068) in view of Kulkarni et al (US Patent No. 6,283,357) and Ford et al (US Patent No. 6,887,356).

With respect to claims 36, 38-42, Rhoades et al discloses a process and apparatus for die forming metallic sheet materials (abstract), where the process utilizes a flowing viscous thermoplastic polymer to stretch the workpiece (i.e. sheet metal blank) into a die utilizing differing pressure, flow rates, and flow sequences (col. 3, lines 19-27), thus the process is considered hydroforming. Fig. 1 depicts a sheet metal blank [22] engaged with a fluid thermoplastic medium [32] controlled via a cylinder [26] also engaged with another fluid thermoplastic medium [30] controlled via cylinders [16a], [16b, [16c], where the blank [22] is placed on a hold down member (i.e. annular platen) [20]. The medium [32] acts as a mandrel and medium [30] acts as a bladder. Fig. 3

depicts the cylinder [26] forces the medium [32] through a central opening to contact a surface of the blank [22], where resistance provided by cylinders [16] form the blank into a desired shape. Rhoades et al also discusses the metal sheet blank being aluminum, titanium, or steel (col. 1, lines 10-15). Figs. 1 and 3-5 depict a first and second region of the blank [22] being deformed by over 35%. However Rhoades et al is limited in that while it is disclosed to use hydroforming to manufacture cup shaped products (col. 1, lines 49-55; col. 4, lines 47-51), it is not suggested to use hydroforming for forming a sputter target.

Kulkarni et al teaches a hollow cathode (i.e. cup shaped) sputter target composed of aluminum, titanium, tantalum, or chromium and formed via hydroforming at room temperature to form microstructures (i.e. crystallographic orientations) (abstract; col. 3, lines 10-41; col. 4, lines 48-51). Kulkarni et al also teaches in fig. 3 a first region defining an end wall and a second region defining sidewalls, where the second has been deformed from the first region by over 35%.

It would have been obvious to one of ordinary skill in the art to use the hydroforming process of Rhoades et al as the hydroforming process of Kulkarni et al since Kulkarni et al fails to disclose a specific hydroforming process and one of ordinary skill would have a reasonable expectation of success in making the modification since Rhoades et al has shown how aluminum can be shaped in a concave manner.

Rhoades et al is further limited in that determining crystallographic orientations of the sputter target are not specified.

Ford et al teaches sputter targets and methods of making the sputter targets (abstract). Ford et al further teaches sputter target composed of tantalum, aluminum, titanium, or copper (col. 5, lines 2-7), with a specific example of commercially pure tantalum of (100) used (col. 9, lines 60-67), where alternatively the target has a texture of a mixed (111)-(100) (i.e. first and second crystallographic orientation) global texture, such that the grain texture having the (100) orientation normal direction to the sputter surface are scattered such that there are no localized groupings of the (100) texture (col. 8, lines 36-42). Ford et al also teaches at least the sidewalls (i.e. second region) are a homogenous microstructure of consistent grain structure and texture (i.e. crystallographic orientations) (col. 4, lines 59-63), thus the end wall or dome (i.e. first region) is not a homogenous mixture. Since Ford et al teaches knowing the crystallographic orientations of the sputter target, a measurement must take place to determine said crystallographic orientations to ensure accuracy and quality of the sputter targets.

It would have been obvious to one of ordinary skill in the art to use the implicit crystallographic orientation measuring method of Ford et al to measure the grains of Rhoades et al to gain the advantages of ensuring accuracy and quality of finished products (i.e. sputter targets).

With respect to claim 37, modified Rhoades et al further discloses that it is known to use pressures of up to 80,000 psi depending on the desired formability of the material (i.e. blank) (col. 3, lines 54-63).

5. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ford et al (US Patent No. 6,887,356) as applied to claim 43 above, and further in view of Kulkarni et al (US Patent No. 6,283,357).

With respect to claim 46, the reference is cited as discussed for claim 43. However Ford et al is limited in that while cold-working is disclosed, it is not suggested for the cold-working to be by hydroforming.

Kulkarni et al teaches a hollow cathode sputter target composed of aluminum, titanium, tantalum, or copper and formed via hydroforming at room temperature to form microstructures (i.e. crystallographic orientations) with or without annealing (abstract; col. 3, lines 10-41; col. 4, lines 48-51). Kulkarni et al also teaches in fig. 3 a first region defining an end wall and a second region defining sidewalls, where the second has been deformed from the first region by over 35%.

It would have been obvious to one of ordinary skill in the art to use the hydroforming process at room temperature of Kulkarni et al as the cold-working process of Ford et al since Ford et al fails to disclose a specific cold-working process and one of ordinary skill would have a reasonable expectation of success in making the modification since Kulkarni et al et al has shown how aluminum, tantalum, titanium, and copper can be shaped in a concave manner by hydroforming at room temperature.

Response to Arguments

6. Applicant's arguments filed 8/28/2008 have been fully considered but they are not persuasive.

103 Rejections

7. On p. 8-9, the Applicant argues that Ford et al faisl to teach a sputter target having two regions of distinct crystallographic orientations. The Applicant also argues that Ford et al does not suggest to using hydroforming to form the sputter target.

The Examiner respectfully disagrees. Ford et al discloses in fig. 1 the sputter target [3] having a top portion [15] and sidewalls [11], thus two different sputtering regions are depicted. In addition, Ford et al also discloses the target has a texture of a mixed (111)-(100) (i.e. first and second crystallographic orientation) global texture, such that the grain texture having the (100) orientation normal direction to the sputter surface are scattered such that there are no localized groupings of the (100) texture (col. 8, lines 36-42), with at least the sidewalls (i.e. second region) being a homogenous microstructure of consistent grain structure and texture (i.e. crystallographic orientations) (col. 4, lines 59-63), thus the end wall or dome (i.e. first region) is not a homogenous mixture. With regards to the hydroforming limitation, while Ford et al only discloses cold rolling (col. 7, lines 25-40), Kulkarni et al teaches an identical sputter target composed of aluminum, titanium, tantalum, or copper and formed via hydroforming or roll forming at room temperature to form microstructures (i.e.

crystallographic orientations) with or without annealing (abstract; col. 3, lines 10-41; col. 4, lines 48-51).

8. On p. 9, the Applicant argues that Rhoades et al fails to teach using hydroforming to make a sputter target.

The Examiner respectfully disagrees. Kulkarni et al teaches making a sputter target from hydroforming (abstract; col. 3, lines 10-41; col. 4, lines 48-51), with Rhoades teaching using hydroforming to make bowl- or cup- (i.e. hollow cathode) shaped sputter targets (col. 1, lines 49-55; col. 4, lines 47-51).

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 8am-4pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

11. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. B./

Examiner, Art Unit 1795

/Alexa D. Neckel/

Supervisory Patent Examiner, Art Unit 1795